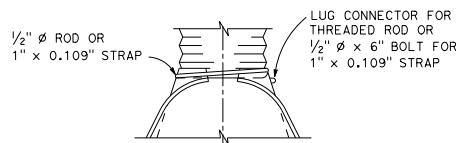
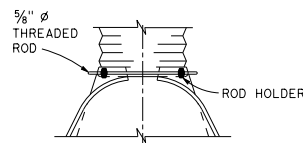


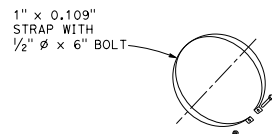
Dist	COUNTY	ROUTE	POST MILES	SHEET TOTAL
			TOTAL PROJECT	NO. SHEETS
REGISTERED CIVIL ENGINEER May 31, 2018 PLANS APPROVAL DATE Bruce D. Swanger No. C61257 EXP. 6-30-19 CIVIL STATE OF CALIFORNIA				
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.				



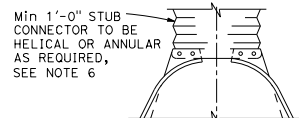
TYPE I



TYPE II



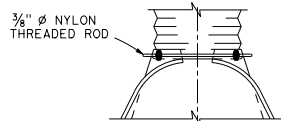
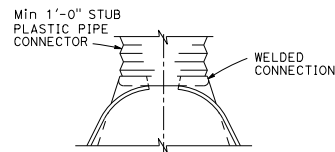
CONNECTOR STRAP DETAIL



TYPE III

ALTERNATIVE CONNECTIONS FOR PIPE TO METAL FLARED END SECTIONS

See Note 7

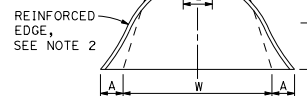

TYPE A
12" - 24"

TYPE B
30" - 36"

ALTERNATIVE CONNECTIONS FOR PIPE TO PLASTIC FLARED END SECTIONS

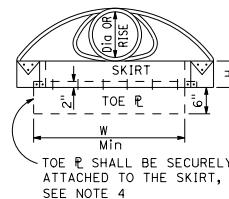
PIPE Dia	END SECTION THICKNESS	CIRCULAR PIPES				
		DIMENSION				
		A	B	H	L	W
12"*	0.064"	6"	6"	6"	1'-9"	2'-0"
15"*	0.064"	7"	8"	6"	2'-2"	2'-6"
18"*	0.064"	8"	10"	6"	2'-7"	3'-0"
21"	0.064"	9"	1'-0"	6"	3'-0"	3'-6"
24"*	0.064"	10"	1'-1"	6"	3'-5"	4'-0"
30"*	0.079"	1'-0"	1'-4"	8"	4'-3"	5'-0"
36"*	0.079"	1'-2"	1'-7"	9"	5'-0"	6'-0"
42"	0.109"	1'-4"	1'-10"	11"	5'-9"	7'-0"
48"	0.109"	1'-6"	2'-3"	1'-0"	6'-6"	7'-6"
54"	0.109"	1'-6"	2'-6"	1'-0"	7'-0"	8'-6"
60"	0.109"	1'-6"	2'-9"	1'-0"	7'-3"	9'-6"
66"	0.109"	1'-6"	3'-0"	1'-0"	7'-3"	10'-0"
72"	0.109"	1'-6"	3'-3"	1'-0"	7'-3"	10'-6"
78"	0.109"	1'-6"	3'-6"	1'-0"	7'-3"	11'-0"
84"	0.109"	1'-6"	3'-9"	1'-0"	7'-3"	11'-6"

* Equivalent plastic FES to meet AASHTO M-294 and ASTM D-1248 Specifications, and shall conform to all dimensions shown above except for end section thickness, which may be 0.004" thinner.

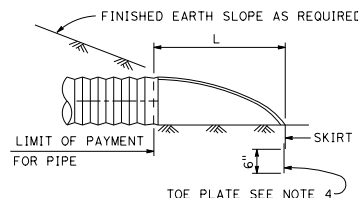
FLARED END SECTIONS FOR CORRUGATED METAL AND PLASTIC PIPE CULVERTS



PLAN

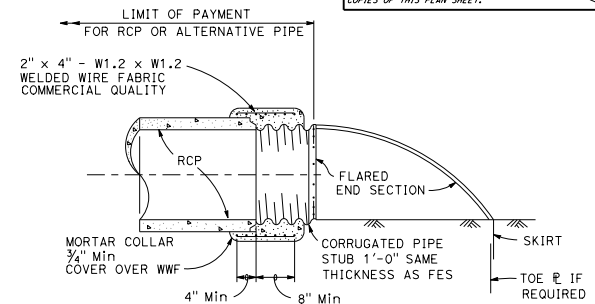


ELEVATION



TYPICAL CROSS-SECTION

DESIGNATION	SPAN	RISE	END SECTION THICKNESS	PIPE-ARCHES				
				DIMENSION				
				A	B	H	L	W
				1"±	Max	1"±	1 1/2"±	2"±
21"	15"	0.064"	7"	10"	6"	1'-11"	3'-0"	
24"	18"	0.064"	8"	1'-0"	6"	2'-4"	3'-6"	
28"	20"	0.064"	9"	1'-2"	6"	2'-8"	4'-0"	
35"	24"	0.079"	10"	1'-4"	6"	3'-3"	5'-0"	
42"	29"	0.079"	1'-0"	1'-6"	8"	3'-10"	6'-3"	
49"	33"	0.109"	1'-1"	1'-9"	9"	4'-5"	7'-1"	
57"	38"	0.109"	1'-6"	2'-2"	1'-0"	5'-3"	7'-6"	
64"	43"	0.109"	1'-6"	2'-6"	1'-0"	5'-10"	8'-6"	
71"	47"	0.109"	1'-6"	2'-9"	1'-0"	6'-5"	9'-6"	
77"	52"	0.109"	1'-6"	3'-0"	1'-0"	6'-5"	10'-6"	
83"	57"	0.109"	1'-6"	3'-3"	1'-0"	6'-5"	11'-6"	



FLARED END SECTION CONNECTION TO RCP

NOTES:

- All 3-piece bodies to have 0.109" thick sides and 0.138" thick center panels. Width of center panels to be greater than 20% of the pipe periphery. Multiple panel bodies to have lap seams which are to be tightly joined by rivets or bolts.
- Reinforced edges to be supplemented with stiffener angles for the 60" thru 84" round, 77" x 52" and 83" x 57" pipe-arch sizes. The angles will be 2" x 2" x 1/4" for the 60" thru 72" round, 77" x 52" and 83" x 57" pipe-arch sizes and 2 1/2" x 2 1/2" x 1/4" for 78" and 84" round. The angles to be attached by 3/8" diameter nuts and bolts.
- Angle reinforcement shall be placed under the center panel seams on the 77" x 52" and 83" x 57" pipe-arch sizes.
- Toe plate to be available as an accessory when specified.
- End of pipe to be finished with annular corrugations to conform flared end section so that minimal leakage results from the connection. Other designs may be used with approval of the Engineer.
- For 12" thru 24" helical end section connection, a universal coupling band attached to the metal end section by rivets, bolts or 1" long shop tack welds spaced at same intervals as dimples may be used in place of the 12" stub. See Standard Plan D97C.
- The types of alternative connections for pipe to metal flared end sections shall conform to the following:

CIRCULAR PIPES -
12" thru 24" Type I or III
30" thru 84" Type II or III

PIPE-ARCHES -
21" x 15" thru 57" x 38" Type II or III
64" x 43" thru 83" x 57" Type III

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

METAL AND PLASTIC FLARED END SECTIONS

NO SCALE

D94A